

Rhine. But now Dr. *C. R. Boettger*¹ described a new variety of *Physa acuta* from Oppeln in Silesia, which he calls var. *thermalis*. It is said to differ from the type by its larger size, thicker shell and irregular surface. In the same locality lives a species of *Sphærium*, which is described as *Sph. tetensi* sp. n., but the author says that it is quite similar to the American *Sph. simile* Say. From the illustration of the new variety of *Physa acuta* it is evident that there is no *acuta* at all, but that this form is quite identical with the large specimens of *Physa heterostropha*, which occurs near Prague of the same size. How the case stands with other records from Central Europe, I dare not say; but it is very probable that all these supposed *Physa acuta* are in reality *P. heterostropha*, which was introduced with American fishes and plants of aquaristic commerce, and which found in our waters suitable circumstances of life. On the contrary *Physa acuta* as an animal of warmer regions of Western Europe scarcely could live any long time in the cold waters of our pools and brooks.

NOTES ON THE ANCYLIDÆ OF NORTH AFRICA.

BY BRYANT WALKER SC. D.

Through the great courtesy of M. Paul Pallary of Oran-Eckmuhl, Algeria, the well-known student of North African Mollusca, I have been recently enabled to study his entire collection of North African *Ancylidæ*.

The collection consists of twenty-nine lots, nineteen from Algeria, six from Morocco, one from Tunis and four from Egypt.

In preparing the following notes, which are based mainly on M. Pallary's collection, I have made use of such additional material as I have in my own collection and such of the literature as I have at my disposal.

I am under special obligations to Dr. E. F. Weber of the Natural History Museum of Geneva, Switzerland, for drawings and inval-

¹ C. R. Boettger, Beiträge zur Kenntniss der Molluskenfauna Schlesiens. Nachrbl. d. deutschen Malakozool. Ges., 1913.

uable information in regard to several of Bourguignat's types, which have enabled me to definitely determine the species described by that author.

The distribution of the *Ancylidae* in North Africa is entirely in accord with the faunal limits set forth by Germain in his recent essay on the "Malacographie de L'Afrique Equatorial", (1909, p. 118). According to that author Africa, north of Lat. 17° N. and including the Azores, the Madeira, Canary and Cape Verde Islands, belongs to the Palæarctic Region. In the fluviatile Mollusca, however, the Valley of the Nile forms an exception and is populated by the characteristic fauna of the Equatorial Region. And this is true, also, in regard to the *Ancylidæ*.

In Europe, *Ancylus* is represented by two, and only two, very distinct groups: *Ancylus s. s.*, of which *A. fluviatilis* L. is the type, and *Acroloxus*, of which the type and only species is the *A. lacustris* L.

The latter does not seem to have extended its range across the Mediterranean. But the *fluviatilis* group is found in great abundance and variety from Abyssinia to Morocco.

Two species have been described from Abyssinia by Jickeli, (1874, p. 223), *A. abyssinicus* and *compressus*, for the latter of which Bourguignat, (1883, p. 84), has proposed to substitute the name of *hamacenicus*, *compressus* being preoccupied both by Parreyss and Nyst. Clessin, (1882, p. 31), considers it to be only a variety of *abyssinicus*.

The collection of M. Pallary contains one species from Tunis.

Thirteen species of more or less doubtful validity have been listed from Algeria by Bourguignat and others.

Four species are listed from Morocco by Pallary in his last catalogue (1904, p. 54.), of the fauna of that country.

The *A. aduncus* Gld. from Madeira is referred to the European *A. striatus* Q. & G. by Wollaston, (1878, p. 470).

According to that author the same species, *striatus*, occurs abundantly on the islands of Grand Canary, Palma and Teneriffe in the Canaries.

The *A. rupicola* Mouss. (1872, p. 141), from Teneriffe is an allied and probably depauperate form of the same species according to Wollaston.

All of these species undoubtedly belong to the group of *A. fluviatilis* and show that the ancyloid fauna of these countries is purely palæarctic.

The single species, however, recorded from the Cape Verde Islands, *A. milleri* Dohrn, (1869, p. 18), so far as can be judged from the imperfect description, would seem to be a *Ferrissia*. If so, it probably marks the extreme northern extension of the Equatorial fauna on the west coast.

The family is not represented at all in the Azores.

In Algeria, in addition to the species of the *fluviatilis* group, are found the two remarkable species described by Bourguignat and for which he created the genus *Brondelia*, (1862, p. 89), *B. drouetiana* and *gibbosa*, which retain the apical whorls in maturity. In this respect they resemble the Tasmanian species of *Ancylastrum*. Unfortunately the soft anatomy of these forms is, as yet, unknown and, until that is determined, the systematic position of the group must remain uncertain. In all probability, it will be found to be more closely related to *Ancylus s. s.* than to *Ancylastrum*.

In both *Brondelia* and *Ancylastrum* the apical whorls are sinistral and the animal is, probably, sinistral also. On the other hand, *Ancylus s. s.*, which loses its sinistrally coiled apical whorls at a very early stage and in maturity has the apex usually more or less turned to the right, never to the left, while the animal is sinistral, is commonly (Taylor, 1895, p. 115) considered an example of heterostrophy. As a matter of fact, a careful study of the shells belonging to the different groups of the *Ancylidæ* will show that the species having the apex turned toward the right are really sinistral in their essential construction. In the same way, *Acroloxus* with its apex turned to the left and a dextral animal would have also in reality a dextral shell.

In view of the prevalence of the various forms of the *fluviatilis* group as a characteristic feature of the fauna of Algeria, it was a cause of great surprise to find among the *Ancyli* of M. Pallary's collection a very distinct and curious species of *Ferrissia*.

The genus *Ferrissia*, for in view of the distinct character of the radula, which will be discussed at length in my final paper on the *Ancylidæ* of South Africa now in preparation, I believe it to be entitled to generic rank, has the most extended range of any group of the *Ancylidæ*. While *Ancylus s. s.* and *Acroloxus* are restricted to the Palæarctic Region of the Old World, *Burnupia* to South Africa, *Ancylastrum* and *Latia* to New Zealand, and *Lanx* and *Lavapex* to America, *Ferrissia*, with the exception of the Palæ-

arctic Region of the Old World (Northern Africa as herein stated excepted) has a world-wide distribution.

With its apparent metropolis in North America, it has recently been found abundantly in South Africa (Walker, 1912, p. 142), and extends northerly along the east coast of the Equatorial Region and in the Valley of the Nile to Alexandria.

Ancylus tanganyicensis Smith (1906, p. 184), is a *Ferrissia*.

The species collected by Blanford (1870, p. 472), in a small stream near Mai Wahiz, Tigre, an affluent of the Nile (l. c., p. 61), and doubtfully referred by him to the Indian *A. verruca* Bens., is also a *Ferrissia*. Blanford's specimens, now in the Indian Museum at Calcutta, was sent in 1908 to the Rev. Prof. Gwatkin of Cambridge, England, to enable him to extract and examine the radula, which he informed me was of the *Ferrissia* type. Through his courtesy the shells were sent to me for examination on their way back to Calcutta. At that time I had no specimens of the Indian species in my collection for comparison and, as I had then no expectation of ever doing any work on the African fauna, I unfortunately neglected to make any description or figures. My note, made at the time, was simply that the specimens were *Ferrissias*. This confirmed Prof. Gwatkin's opinion based on his examination of the radula and settled the generic position of the form, though, unfortunately, its specific character must remain uncertain until it can be more critically examined.

There are, so far as I know, no authentic records of the occurrence of *Ferrissia* on the west coast of Equatorial Africa. As already stated, it seems probable that the *A. milleri* Dohrn from the Cape Verdes belongs to this group, but only an examination of the types can definitely determine that question.

There is every probability, however, that, sooner or later, *Ferrissia* will be found to be of general distribution in Equatorial Africa.

The Indian *A. verruca* Bens., the Japanese *A. baconi* Bgt., the Australian *A. australis* Tate, the New Zealand *A. woodsi* John., (possibly the non-septate form of a *Gundlachia* according to Hedley, 1895, p. 66), and the Hawaiian *A. sharpi* Sykes are all *Ferrissias*.

This world-wide distribution of *Ferrissia* is very significant and goes to show that, like certain other fresh-water pulmonate types of similar distribution, it is probably of very ancient origin. And the apparent agreement between its present range and the conditions of

land and water in Upper Cretaceous times as depicted by Ortmann (1902, p. 381), may be more than a mere coincidence.

While *Ferrissia* and *Laevapex* are very closely related, the world-wide range of the former is in marked contrast with the restricted one of the latter, which is apparently confined to America.

I can not accept Hannibal's statement, (1912, p. 153), that the *Ancylidæ* have been evolved "from simple, patelliform ancestors". I agree rather with Grabau, (1902, p. 921), that "our modern patelliform species are probably not primitive types", but are descended from ancestors with spiral shells. The persistence of spiral apical whorls in *Brondelia* and *Ancylastrum* and the deciduous spiral apex of *Ancylus s. s.* would seem to be conclusive on that point.

While there may be no great force in an argument based on the usually thinner and flatter shell of *Laevapex* as compared with that of *Ferrissia*, so far as it goes, it tends to show a progressive degeneration of the shell-secreting function in the former group.

For these reasons I can not follow Hannibal, (1. c. p. 150), in subordinating *Ferrissia* to *Laevapex* as a subgenus. To my mind, the reverse is actually the fact and *Laevapex* is a comparatively recent offshoot from the ancient *Ferrissia* stock.

My main purpose in undertaking the examination of the Pallary collection was to determine as far as possible the relative range of *Ancylus s. s.* and *Ferrissia* in North Africa. It would be quite impossible for any one without access to types of Bourguignat and large series of Palæarctic material either to attempt to identify Bourguignat's species or to satisfactorily determine the validity of the African species belonging to the *fluvialis* group. And I have not attempted to do so.

(To be continued.)

POISONING BY THE BITE OF CONUS GEOGRAPHUS.¹

The following report by Dr. A. Herbert Hallen was forwarded to the Australian Museum, Sydney, by Dr. B. G. Corney, from Fiji, 10th September, 1901. Accompanying it was a shell, identified as *Conus geographus*, said to be similar to the one that inflicted the severe bite described. The following is the extract from the Gov-

¹ From *The Australasian Medical Gazette*, September, 1912.